Specification

INFORMATION PROVISION DEVICE, CONSTRUCTOR MANAGEMENT DEVICE, INFORMATION PRESENTATION DEVICE, PROGRAM, COMUNICATION SYSTEM AND INFORMATION PROVISION METHOD

Field of the Invention

[0001]

The present invention relates to an information provision device, an information presentation device, a program, an information provision system and an information provision method, which recommend and provide information appropriate for a person who wishes to receive such information and to a constructor management apparatus for managing constructors.

Background Art

[0002]

Previously, construction ordering agent services have been provided in which, when implementing work such as installation, maintenance, inspection, repairs or the like (hereinafter, such work will be referred to as “construction”) of various facilities including: electrical facilities such as an air conditioning facility, a lighting facility or the like, and piping facilities, which are located in a building or the like; the building itself; or general electrical appliances (hereinafter, such facilities will be referred to as “facilities”), construction requests made by users of such facilities (hereinafter, simply referred to as “users”), distributors of the facilities or electrical appliance manufacturers, general contractors, apartment developers, house builders or the like, which are related to the facilities, are received *en bloc* at an establishment such as a customer center or the

like, and operators in such establishment arrange constructors appropriate for the requested content.

[0003]

Under such circumstances, in recent years, a system has been proposed in which: one or more constructors are selected, which are capable of arriving at the construction site (hereinafter, referred to as "site-arrival") within a predetermined time period based on the distance or the like from the construction site; and information regarding such constructors (such as contact telephone number, mobile e-mail address, location, constructor name, and the like) is caused to be displayed as recommendation information on a terminal device of the operators (hereinafter, referred to as an "operator terminal device"), and thereby, construction order receiving and placing operations by the operators are facilitated and the work efficiency thereof is improved (see, for example, Patent Document 1).

[0004]

In particular, in such system, an estimated time period required for the respective constructors to arrive at the construction site is calculated based on the distance between two points, or the like, between the address of the construction site and the locations of the constructors, and one or more constructors are selected and recommended to the operators.

Prior Art Documents

Patent Documents

[0005]

[Patent Document 1] JP2008-204403A

Summary of the Invention

Problems to be Solved by the Invention

[0006]

However, in the system disclosed in the above-described Patent Document 1, although constructors which are capable of rapidly arriving at the construction site can be identified, since there is a large amount of work in which the possession of predetermined skills (national qualifications, industry recommended qualifications or the like) is a prerequisite for construction depending on the content thereof, there may be cases where the selected constructors fail to possess the skills required in order to implement the requested construction and thus, appropriate constructors cannot be selected and recommended.

[0007]

In addition, in the system disclosed in the above-described Patent Document 1, since the respective constructors may have already taken other construction orders, schedule adjustment or the like may be time consuming and the construction may not be carried out promptly.

[0008]

The present invention has been made in order to solve the above problems, and an object thereof is to provide an information recommendation provision device, etc., which is capable of improving the operational efficiency of construction ordering agent services in which construction work orders are received or placed in accordance with requests from clients.

Means for Solving the Problems

[0009]

(1) In order to solve the above problems, an information provision device, etc. according to the present invention has a configuration in which it is provided with: a record management unit that manages a database in which: constructor attribute information including at least a location and a name for each of a plurality of

constructors; and qualification information including at least skill information indicating a type of construction which the constructor is capable of performing and schedule information indicating a schedule when the constructor is capable of receiving an order for construction work, are associated with each other and recorded thereon; a construction request information obtaining unit that, when the construction work is requested from a client, externally obtains construction request information including a position of a construction site, construction content indicating content of the construction work, and a schedule; an extraction unit that extracts, from the record unit, constructors, which are capable of receiving an order for the requested construction work, based on the construction content and the schedule indicated by the obtained construction request information and on the recorded qualification information; a calculation unit that calculates priority information indicating priorities of the respective constructors, which are capable of receiving an order for the requested construction work, based on a calculation element including at least a distance between two points to the effect of the position of the construction site and the respective locations of the constructors included in the constructor attribute information; a selection unit that selects at least one of the constructors which are capable of receiving an order for the requested construction work, as a selected constructor, based on the calculated priorities: and an information provision unit that provides information regarding the selected constructor, as recommendation information, to a person who wishes to have a constructor selected, in such a manner that the person can inspect the information.

[0010]

(2) In addition, in order to solve the above problems, a constructor management apparatus according to the present invention has a configuration in which it is provided with: the above-described information provision device; a site-arrival reporting obtaining unit that obtains, from a communication terminal device of an order-received constructor, being the constructor which is selected based on the

recommended information and which receives the order for the construction work, site-arrival reporting indicating that the constructor has arrived at the construction site and site-arrival positional information indicating the position at the time of the site-arrival reporting, in such a manner that the site-arrival reporting and the site-arrival positional information are associated with each other; a site-arrival time/date information obtaining unit that obtains information on a site-arrival time and date, indicating a time and date when the site-arrival reporting is obtained; a site-arrival positional information cross-check unit that cross-checks whether or not the site-arrival position indicated by the site-arrival positional information matches the location of the construction site; and a management unit that performs data management of the status of construction work at the order-received constructor based on the obtained site-arrival time and date and a cross-check result of the site-arrival position.

[0011]

(3) In addition, in order to solve the above problems, a constructor management apparatus according to the present invention has a configuration in which it is provided with: the above-described information provision device; a work completion report obtaining unit that obtains, from a communication terminal device of the order-received constructor, work completion reporting indicating that the construction work has been completed; a work completion time/date information obtaining unit that obtains information on a time and date of work completion, indicating a time and date when the work completion reporting is obtained; and a management unit that performs data management of the status of construction work at the order-received constructor based on the obtained work completion time and date.

[0012]

(4) Moreover, an information presentation device according to the present invention has a configuration in which it includes: an operation unit for inputting, when the construction work is requested from the client, the construction request information

indicating the position of the construction site, the construction content indicating content of the construction work, and a construction period; a recommendation information obtaining unit that obtains, as recommendation information, information regarding at least one selected constructor which is selected based on the construction content and the construction period indicated by the obtained construction request information and on a calculation element including at least a distance between two points to the effect of the position of the construction site and the respective locations of the constructors included in the constructor attribute information; and an information presentation unit that displays the information regarding the selected constructor, based on the recommendation information obtained by the recommendation information obtaining unit, to a person who wishes to have a constructor selected, in such a manner that the person can inspect the information.

Effect of the Invention

[0013]

An information provision device, etc. according to the present invention is capable of improving the operational efficiency of construction ordering agent services in which construction work orders are received or placed in accordance with requests from clients, and is also capable of appropriately managing construction work by managing the position at the time of reporting, preventing incorrect reporting by a constructor or a worker thereof, and the like.

Brief Descriptions of the Drawings

[0014]

Fig. 1 is a system configuration diagram illustrating a configuration of a communication system in an embodiment according to the present invention.

Fig. 2 is a block diagram illustrating a configuration of a server of an embodiment.

Fig. 3 is a diagram illustrating an example of data to be recorded in a client management database provided in a server of an embodiment.

Fig. 4 is a diagram illustrating an example of data to be recorded in a constructor management database provided in a server of an embodiment.

Fig. 5 is a diagram illustrating an example of data to be recorded in a construction history database provided in a server of an embodiment.

Fig. 6 is a diagram illustrating an example of data to be recorded in a written report database provided in a server of an embodiment.

Fig. 7 is a diagram illustrating an example of written report data to be recorded in a written report database of an embodiment.

Fig. 8 is a diagram illustrating an example of data to be recorded in a qualification management database of an embodiment.

Fig. 9 is a diagram illustrating an example of an image for creating reporting data of an embodiment.

Fig. 10 is a diagram illustrating an image example of work completion report to be displayed on an operator terminal device of an embodiment.

Fig. 11 is a flowchart illustrating a recommendation information provision process to be performed when a request for construction is made from a client in a server of a communication system of an embodiment.

Fig. 12 is a diagram illustrating an example of a written work instruction to be printed at the time of requesting construction work at constructor terminal device 40 in a communication system of an embodiment.

Fig. 13 is a flowchart illustrating a reporting process in which site-arriving reporting and work completion reporting are performed in a constructor terminal device and a server in a communication system of an embodiment.

Embodiments of the Invention

[0015]

Hereinafter, the embodiments of the present invention will be described with reference to the drawings. It should be noted that the following embodiments are embodiments in which, when an information provision device, an information presentation device, a constructor management apparatus, a program, a communication system, and an information provision method according to the present invention are applied to a communication system including a communication terminal device that is possessed by each constructor (hereinafter, referred to as a "constructor terminal device"), a server that communicates with and connects to such constructor terminal device via a network, and a terminal device (operator terminal device) that performs various processes in conjunction with the server based on operations by an operator.

[0016]

[1] Communication system

First, the configuration and the outline of communication system 1 in the present embodiment will be described with reference to Fig. 1. It should be noted that Fig. 1 is a system configuration diagram illustrating the configuration of communication system 1 of the present embodiment. In order to prevent complication of the drawing, Fig. 1 only illustrates some of the constructors and operators. In other words, in the actual communication system 1, there exist more constructors, operators, terminal devices for constructors, and terminal devices for operators than those shown in the figure.

[0017]

Communication system 1 of the present embodiment is a system in which, when a construction request is received from a client (not shown), based on information (hereinafter referred to as "construction request information") indicating the requested content (i.e. content or type of construction work, construction site address, desired construction period, and the like), one or a plurality of constructors appropriate for such construction is/are selected and the information regarding such selected constructors

(such as contact telephone number, constructor name, location, or the like) is provided as recommendation information.

[0018]

In addition, communication system 1 of the present embodiment is a system that performs data management of construction site work at a constructor, which is the selected constructor and which received an order for construction work (hereinafter, referred to as an “order received-constructor”).

[0019]

In particular, communication system 1 has a configuration in which:

(1) from among a plurality of constructors, constructors that possess skills required for the requested construction work and that are capable of starting the construction work in terms of schedule (i.e. a constructor with a free schedule) are extracted;

(2) priorities of the respective extracted constructors are calculated based on various kinds of information;

(3) at least one or more constructors that satisfy a predetermined condition are selected based on the calculated priorities;

(4) information regarding such selected constructors (for example, location, contact telephone number, e-mail address, and the like) is generated as recommendation information; and

(5) the generated recommendation information is provided to a person who wishes to receive such information, such as an operator, in such a manner that the person can inspect such information.

[0020]

Furthermore, communication system 1 has a configuration in which: when a person who wishes to receive such information identifies a constructor based on the recommendation information, communication system 1 performs the respective

processes including: a process of notifying the constructor; a work reporting process such as reporting on site-arrival (hereinafter, referred to as “site-arrival reporting”), reporting on construction work start (hereinafter, referred to as “work start reporting”), reporting on construction completion (hereinafter, referred to as “work completion reporting”), or the like; and a payment process regarding payment, and management of various kinds of data regarding the construction work and the constructor that carries out the construction work is performed.

[0021]

In particular, communication system 1 of the present embodiment includes: a plurality of operator terminal devices 10 provided in service center SC; network 20; server 30 that directly provides a constructor to be recommended, which is capable of performing construction work as recommendation information to operator terminal devices 10 or clients’ communication terminal devices (not shown) and that performs management of various kinds of data regarding construction work; and constructor terminal devices 40 possessed by the respective constructors.

[0022]

It should be noted that service center SC is an establishment in which are located: operator terminal device 10 for registering, when a construction request from a client is received over the telephone or through a web service, construction request information with the communication system, which is based on the received construction request; and server 30 that arranges (i.e. places an order) and manages the requested construction based on such construction request.

[0023]

In addition, in the present embodiment, the method of receiving construction requests is arbitrary. For example, in addition to personal construction request receipt by an operator over the telephone or facsimile from a client, receipt through e-mails, or electronic receipt by way of an application page on a website for applying for

construction through WWW (World Wide Web) web services created in server 30, is included.

[0024]

However, server 30 is configured such that, when the operator receives the construction request over the telephone, it obtains construction request information which is input by the operator via operator terminal device 1, and when the construction request is received through e-mails or from the website for applying for construction, it directly obtains the construction request information.

[0025]

Operator terminal device 10 is a terminal device such as a personal computer (PC) or the like located in service center SC, and it communicates with and connects to server 30 either directly or via an intranet (not shown) within service center SC. It should be noted that intercommunication functionality of operator terminal device 10 is not necessarily required.

[0026]

In addition, operator terminal device 10 has a configuration in which, when the personal request for construction is made from a client over the telephone or through facsimile, a screen for causing construction request information to be input in accordance with the input operations by the operator and it therefore has a configuration in which the construction request information is generated in accordance with inputs by the operator and such construction request information is provided to server 30.

[0027]

On the other hand, operator terminal device 10 is configured such that, when the electronic request for construction is made from a client through e-mails, etc., it displays on a screen that such request has been made and it also displays the information on the request received from the client, under the instructions of server 30.

[0028]

In particular, operator terminal device 10 has a configuration in which, while displaying on a display the generated construction request information or the obtained construction request information, it can use such construction request information when performing placement of orders for construction work, which is conducted by the operators, to the constructors in accordance with the construction request information.

[0029]

On the other hand, operator terminal device 10 has a configuration in which, when a constructor has been identified, it works in conjunction with a relevant constructor terminal device 40 so as to provide the construction work information to such constructor.

[0030]

It should be noted that, in the present embodiment, provision of the construction work information to constructor terminal device 40 is performed by way of one of:

(1) a method in which a Uniform Resource Locator (URL) or a bar code (such as QR code (registered trademark), etc.) required for obtaining the construction work information and the surrounding area map is provided in an e-mail and such e-mail is sent from operator terminal device 10 to constructor terminal device 40; or

(2) a method in which a predetermined application is started by constructor terminal device 40 and the construction work information and the surrounding area map are obtained by following the procedures of such application. However, such method of provision is arbitrary and it is not limited to the above.

[0031]

Server 30 is provided with storage 330 that has various databases (hereinafter, the database will be referred to as a "DB"). Server 30 is configured such that it obtains construction request information from operator terminal device 10 or a communication terminal device (not shown) of a client, generates recommendation information based

on data within the DBs and the construction request information, and provides it to operator terminal device 10 or the client's communication terminal device.

[0032]

Furthermore, server 30 has a configuration in which, when it obtains the construction request information, it allocates a construction ID for uniquely identifying such construction request and manages the respective constructions based on the construction IDs. It also has a configuration in which, by operating in conjunction with operator terminal device 10 and constructor terminal device 40, it performs registration and updating of various kinds of data so as to manage the entire construction ordering agent service.

[0033]

Constructor terminal device 40 is, for example, a smartphone or tablet-type information terminal device or a communication terminal device that can be carried by a worker of the constructor, such as a portable phone or the like, and is used, when the operator places an order for construction, to obtain construction work information necessary for the construction from service center SC, and to present such construction work information to the worker.

[0034]

In particular, constructor terminal device 40 has a configuration in which: construction work information, etc., voice call function, transmission/reception function of e-mails, and resource data described in a markup language such as an eXtensible Markup Language (XML), etc. are obtained based on the URL; and the image display and the data communication are performed by means of a browsing function based on such resource data.

[0035]

In addition, constructor terminal device 40 has a configuration in which it accesses a website established by server 30 and in which reporting processes of

site-arrival reporting, including work start reporting, and work completion reporting are performed by making use of an application that works in conjunction with server 30 by the browsing function or by making use of an e-mail having a predetermined format.

[0036]

It should be noted that constructor terminal device 40 is configured such that, when performing reporting processes, including site-arrival reporting and work completion reporting, it receives global positioning system (GPS) signals from GPS satellite 50, extracts positional information indicating its own current position (latitude and longitude) based on such GPS signals, and then performs the respective reporting processes, including site-arrival reporting and work completion reporting, with respect to server 30 having such detected positional information added thereto.

[0037]

Constructor terminal device 40 has an interface based on, for example, Bluetooth (registered trademark), and it builds a personal area network (PAN) with, for example, a portable printer, an IC card reader, or the like. Thus, it has a configuration in which a work itemized slip (hereinafter, referred to as a "written work instruction") corresponding to the construction work information, receipts, or the like, can be printed out and, in terms of the payment of construction fees, payment procedures using a credit card can be performed.

[0038]

By having such configuration, communication system 1 of the present embodiment is configured such that it can provide, in an accurate manner, to an operator (i.e. a person who wishes to have a constructor selected) information (as recommendation information) on a constructor which is capable of rapidly performing the construction work based on the distance between the position of the construction site and the position of the constructor, while excluding constructors with no skills for performing the externally requested construction and constructors which are incapable

of receiving the orders in terms of their schedule.

[0039]

Accordingly, communication system 1 of the present embodiment is configured such that it can place orders for construction work by determining a constructor which is capable of performing the construction work, in a simple, rapid and accurate manner, in accordance with requests from clients with respect to people who wish to have a constructor selected, and thus, the operational efficiency of construction ordering agent services in which receiving and placing of orders for construction work are carried out in accordance with requests from clients can be improved.

[0040]

In addition, communication system 1 of the present embodiment is configured such that it grasps, with certainty, the date and time of the arrival of the requested constructor at the construction site, it can control the time required from the request for construction to the site-arrival, it manages the positions at the time of reporting, and it can perform data management of construction work in an appropriate manner such as to prevent, for example, any incorrect reporting from the constructor or a worker thereof.

[0041]

[2] Server

Next, the respective configurations of server 30 of the present embodiment will be described with reference to Figs. 2 to 10. It should be noted that Fig. 2 is a block diagram illustrating the configuration of server 30 of the present embodiment. Figs. 3, 4, 5 and 6 are diagrams respectively illustrating examples of data to be recorded in client management DB 331, constructor management DB 332, construction history DB 333, and report DB 334 of the present embodiment. In addition, Fig. 7 is a diagram illustrating an example of written report data to be recorded in report DB 334, and Fig. 8 is a diagram illustrating an example of data to be recorded in qualification management DB 335 of the present embodiment. Furthermore, Fig. 9 is a diagram

illustrating an example of an image for creating reporting data to be displayed on constructor terminal device 40 of the present embodiment, and Fig. 10 is a diagram illustrating an image example of work completion report to be displayed on operator terminal device 10.

[0042]

As shown in Fig. 2, server 30 of the present embodiment includes: communication controller 310 that communicates with and connects to network 20; ROM/RAM 320 that serves as various kinds of memory; storage 330 including various DBs; server management controller 340 that controls the entire saver; data processor 350 that selects a constructor corresponding to construction request information and that performs a constructor recommendation process that generates recommendation information; and timer 360 for identifying the current time and date. It should be noted that the above-described respective parts are connected to each other by bus B and that data transfer is performed between the respective components.

[0043]

Communication controller 310 is a predetermined network interface, and it builds a communication channel and performs transferring and receiving of various kinds of data with constructor terminal device 40 and a client's communication terminal device (not shown) via network 20 and also performs transferring and receiving of various kinds of data with operator terminal device 10.

[0044]

It should be noted that communication controller 310 may have an interface for connecting to network 20 and a separate interface for an intranet so that the communication with network 20 and the communication within the intranet may be separated.

[0045]

ROM/RAM 320 has recorded thereon various programs required for driving

server 30. ROM/RAM 320 is also used as a work area when various processes are performed.

[0046]

Storage 330 is configured by a hard disc drive (HDD) or a solid state drive (SSD). Storage 330 includes, at least, client management DB 331, constructor management DB 332, construction history DB 333, report DB 334, and qualification management DB 335. It should be noted that, for example, storage 330 of the present embodiment may configure a database of the present invention.

[0047]

Client management DB 331 is a database in which various kinds of information for managing clients of the construction ordering agent services (i.e. users who use services) are registered as data. For example, as shown in Fig. 3, in client management DB 331:

(1) a client ID allocated to each client;

(2) client attribute information including, at least, the name, address or location, telephone number, e-mail address, and payment information of the relevant client; and

(3) request history information that indicates the requests made by the relevant client in the past, are registered in association with each other.

[0048]

For example, according to the case illustrated in Fig. 3, in association with the client ID “U001,” the client attribute information including the name of the client “XX Company,” the location “Tokyo, …,” the telephone number “03*****,” the e-mail address “**@XX.co.jp,” and the payment information “XX Bank, account **” are registered, and also information including the number of requests “10,” and the construction prohibited constructor “XX Electrics” is registered as the request history information.

[0049]

It should be noted that this information may be registered on client management DB 331 at the time of an initial construction request. However, in the present embodiment, it is assumed that, in order to facilitate management and registration of data, user registration is performed in advance and thus, such information is already registered.

[0050]

Furthermore, the construction prohibited constructor is information which is individually registered when a client has prohibited placement of orders for constructions due to the fact that the level of satisfaction with past construction requests is low. For example, information that can identify the relevant constructor, such as the name of such constructor, or the like, may be registered at service center SC.

[0051]

In addition, request history information may further be recorded with various kinds of information, including the construction site address, the constructors which received orders for construction work requested in the past, the construction fees at the time, the construction time and date, the construction work content or the like.

[0052]

Constructor management DB 332 is a database in which information for managing each constructor is registered. For example, as shown in Fig. 4, in constructor management DB 332:

(1) a constructor ID for identifying each constructor;

(2) constructor attribute information including information such as the name, location, telephone number, e-mail address or the like of the relevant constructor; and

(3) qualification information corresponding to the relevant constructor, are registered in association with each other.

[0053]

In addition, the qualification information includes:

(a) skill information indicating national qualifications or the like (hereinafter, referred to as “qualifications or the like”) possessed by the relevant constructor;

(b) order receipt rate information indicating the order receipt rate of the relevant constructor in the past;

(c) order acceptable period indicating the schedule when the relevant constructor can accept the construction; and

(d) evaluation information indicating the evaluations made by clients on the construction performed by the relevant constructor in the past.

[0054]

More specifically, the qualification information may not always need to include each of the respective items of information of (a) to (d), and it may be enough to include at least information items (a) and (c).

[0055]

For the evaluation information, an average value of the evaluations may be used, such evaluations being made on the construction implemented in a predetermined period of time in the past, or the evaluation information may include all the evaluations made on the construction carried out in a predetermined period of time in the past. However, in the present embodiment, since there is a high possibility of the capability of the constructor being improved through re-education, or the like, of the constructor, and the validity of old evaluations being considered to be low, the evaluation information made on the construction implemented more than one year beforehand is, in principle, not included in the evaluation information.

[0056]

Moreover, the constructor attribute information and skill information to be registered on constructor management DB 332 are registered when the constructor is registered in advance.

[0057]

On the other hand, the order receipt rate indicates a rate of actual orders which the selected constructor received in past constructions based on, for example, the construction fee quotation or the like prior to the construction. The order receipt rate may be automatically calculated and registered or registered based on the operations of operator terminal device 10.

[0058]

It should be noted that Fig. 4 illustrates information for managing the respective constructors registered on constructor management DB 332. In particular, in Fig. 4, the constructor ID "C001" corresponds to a constructor named "ABC Electrics" and, as for the qualification information, the skill information "Electrical work operation and management engineer (second class)," the order receipt rate "30%" and the evaluation information "☆☆☆" are registered.

[0059]

In addition, in the illustration of Fig. 4, the evaluation information is expressed by way of the number of star marks; however, it may also be expressed in figures indicating the evaluation level of the client with respect to the relevant constructor or it may be evaluated in a three-rank approach including "good," "average" and "poor." The evaluation information is determined, after completion of the construction, based on an evaluation made by the client on the relevant implemented construction and is then registered on constructor management DB 332.

[0060]

Furthermore, regarding a constructor for which a client wishes to refuse the implementation of their construction work, in other words, a constructor prohibited from the construction work (hereinafter, referred to as a "construction prohibited constructor"), it may be included in the evaluation information. However, the present embodiment may be configured such that, in order to simplify data management, the relevant constructor may be separately registered on client management DB 331 as a

construction prohibited constructor and it may be associated with the evaluation information by means of the constructor ID or the constructor name.

[0061]

Construction history DB 333 is a database for managing information regarding the construction history of the construction implemented in the past as data. For example, as shown in Fig. 5, in construction history DB 333:

(1) a construction ID;

(2) construction request information;

(3) date and time of construction request for the relevant construction; and

(4) work history information, all of which are allocated to each construction work, are registered in association with each other.

[0062]

More specifically, the construction request information includes the contact information of the person in charge of the client, construction site address, desired construction time and date, construction work content, construction type, and the like.

[0063]

Moreover, the work history information includes, based on the site-arrival reporting and the work completion reporting conducted by the worker by means of constructor terminal device 40:

(a) time and date of site-arrival reporting;

(b) positional information at the time of site-arrival;

(c) cross-check result with respect to the site-arrival reporting;

(d) time and date of work completion reporting;

(e) positional information at the time of completion;

(f) cross-check result with respect to the work completion reporting; and

(g) status information indicating the status of the work.

[0064]

It should be noted that each of the cross-check results indicates whether or not the positional information added to the site-arrival reporting and the work completion report and the construction site location match one another, and that the status information is information that indicates a status on whether the relevant construction is still a work-in-progress or whether it has been completed. In particular, the status information is changed from "work-in-progress," which corresponds to the time between the order placement of the construction and the construction complete reporting being made, to "completed" at the time when the completion reporting is received.

[0065]

For example, in Fig. 5, regarding the construction identified by the construction ID "W001" and the construction request information "Request 1," data is shown in which a worker conducts site-arrival reporting at "12:00 on February 1, 2013," the positional information at that time is "N: 36.626446, W: 138.723444," which matches the construction site location, and work completion reporting is conducted at "17:00 on February 1, 2013" at the location of "N: 6.626446, W: 138.723444."

[0066]

Report DB 334 is a database for performing recording and management of data that configures a written report (hereinafter, referred to as "written report data"), which is uploaded from constructor terminal device 40 along with work completion reporting. As shown in Fig. 6, written report data is registered in association with each construction ID.

[0067]

For example, Fig. 6 illustrates an example in which information "written report 1" is registered as written report data having a predetermined data format of the construction work indicated by the construction ID "W001." In addition, as shown in Fig. 7, data of each written report includes, for example, information items such as the

name of the construction site, the address of the construction site, the work content, the work date, various photographs and comments made with respect to each photograph, and it also includes format information that defines a display format such as shown in Fig. 7.

[0068]

It should be noted that, in Fig. 7, regarding the construction work in which "replace inverter for down light" is carried out, an example of written report data is illustrated in which construction site photograph P1 prior to beginning the work, photograph P2 showing the failed part, photograph P3 showing the new part to be attached, and construction site photograph P4 after completion of the work are all attached to the written report, wherein text comments are provided with respect to each photograph.

[0069]

In addition the written report data is adapted such that it is generated and uploaded in conjunction with a website or an application in constructor terminal device 40.

[0070]

Qualification management DB 335 is a database for managing qualifications or the like which are required for implementing the relevant construction on a construction content basis. For example, as shown in Fig. 8, in qualification management DB 335, the names of qualifications that are specified by the law or the like for implementing the relevant construction are registered in association with the respective construction contents.

[0071]

It should be noted that, although in the case illustrated in Fig. 8, the names of the necessary qualifications are registered on a construction content basis, the implementable construction content (work content) may, for example, be identified on a

qualification name basis by means of a flag or the like.

[0072]

Server management controller 340 is mainly configured by a central processing unit (CPU) and the respective parts of server 30 are integrally controlled by executing a program.

[0073]

Under control by server management controller 340, data processor 350 operates in conjunction with communication controller 310 and storage 330 by executing an application, and it substantializes DB management controller 351 that performs registration and updating of data to the respective databases, constructor recommendation device 352 that performs a constructor recommendation process, and payment processor 353 that performs payment of the construction fees.

[0074]

It should be noted that DB management controller 351 of the present embodiment configures, for example, record managing means, construction request information obtaining means, request information obtaining means, site-arrival reporting obtaining means, work completion reporting obtaining means and written report provision means of the present invention. Constructor recommendation device 352 configures extraction means, calculation means, selection means and information provision means.

[0075]

DB management controller 351 performs registration and management of construction request information obtained from operator terminal device 10 or a client's terminal device (not shown), and also performs registration and updating of data based on the site-arrival reporting and the work completion reporting from constructor terminal device 40 with respect to client management DB 331, constructor management DB 332 and construction history DB 333.

[0076]

In addition, when DB management controller 351 receives, via the website or by means of an e-mail, the respective report data of the site-arrival reporting and the work completion reporting, which were created by a worker using constructor terminal device 40, DB management controller 351 performs reporting processes of site-arrival reporting and work completion reporting, in which a construction ID of the construction work contained in such reporting data is identified, and such construction ID and the written report data contained in such reporting data are associated with each other and registered in report DB 334.

[0077]

For example, as shown in Fig. 9, a “site-arrival” button is selected by means of constructor terminal device 40, at the time of site-arrival. At the time of work completion, work reporting is input, a photograph of the construction site is taken and then a “work completion” button is selected to send out various kinds of reporting data of the site-arrival reporting and the work completion reporting including the written report data. DB management controller 351 receives the various kinds of reporting data and updates construction history 333 and report DB 334 based on the received reporting data.

[0078]

On the other hand, when a client wishes to inspect the reporting data of predetermined construction work via operator terminal device 10 or a predetermined website, DB management controller 351 generates image data following a predetermined display format based on the various kinds of information recorded on construction history DB 333 and report DB 334 and provides the generated image data to operator terminal device 10 or the client’s communication terminal device (not shown).

[0079]

For example, under the instructions by operator terminal device 10, when an instruction is provided for inspecting the work completion report for the relevant construction work, DB management controller 351 reads out various kinds of information on the relevant construction work from report DB 334, and generates image data D such as that shown in Fig. 10, and provides such generated image data D to the relevant operator terminal device 10.

[0080]

Furthermore, under the instruction by a client's communication terminal device (not shown), DB management controller 351 receives evaluation made on the constructor that was in charge of the construction work. When evaluation is made by a client, the evaluation information of constructor management DB 332 is updated based on such evaluation result.

[0081]

Constructor recommendation device 352 generates recommendation information by performing a constructor recommendation process and provides such recommendation information to operator terminal device 10 or a client's communication terminal device. Constructor recommendation device 352 of the present embodiment and the constructor recommendation process will be described below.

[0082]

Payment processor 353 calculates construction fees for the construction ordered and performs processes necessary for the payment. It should be noted that payment processor 353 may be substantialized by providing a server (not shown) dedicated for payment on network 20, or the payment process may be achieved in conjunction with such server dedicated for payment.

[0083]

[2.2] Constructor recommendation part

Constructor recommendation device 352 includes, for performing a constructor

recommendation process under the instructions by an operator by way of operator terminal device 10: constructor extractor 352A that extracts a constructor which possesses skills required for the requested construction work and which is capable of starting the construction in terms of schedule; priority calculator 352B that calculates priorities corresponding to the respective extracted constructors; constructor selector 352C that selects a constructor based on the calculated priorities; and recommendation information generator 352D that generates recommendation information and provides it to operator terminal device 10.

[0084]

Constructor extractor 352A obtains construction request information from operator terminal device 10 or a client's terminal device, conducts a search in qualification management DB 335 based on the construction content contained in the obtained construction request information, and identifies qualifications required for the requested construction work. Then, constructor extractor 352A uses such qualifications as a search key to conduct a search in constructor management DB 332, reads out the result of such search, i.e. the construction IDs of all the constructors that come up as a result of the search, and causes them to be recorded on ROM/RAM 320.

[0085]

Furthermore, from among the read out constructors, constructor extractor 352A selects constructors which have a construction period that matches the order receivable period and updates the constructor IDs recorded on ROM/RAM 320. It should be noted that, at this moment, ROM/RAM 320 only has recorded thereon the construction IDs of the constructors which possess the skills required for the requested construction work and which are capable of starting the construction in terms of schedule.

[0086]

Priority calculator 352B reads out constructor attribute information from constructor management DB 332 based on the constructor IDs (i.e. the constructors

which are capable of working on the requested construction work) recorded on ROM/RAM 320, and calculates distance X between two points (hereinafter, referred to as the "distance between two points"), i.e. the position of the construction site contained in the construction request information and the location of the constructor, so as to calculate priority P in accordance with, for example, formula 1 below.

[0087]

Priority P = A(1/X) + BY + CZ … (formula 1)

[0088]

It should be noted that, in formula 1, "A," "B" and "C" denote weighting coefficients, "Y" denotes evaluation information expressed in a numerical value, and "Z" denotes an order receipt rate.

[0089]

However, "A," "B" and "C" can be set or changed in an arbitrary manner since the calculation criteria of priority P may be changed based on the time or in response to requests from clients. For example, priority P of a constructor having a high evaluation from clients in the past may be set higher or priority P of a constructor which has a shorter distance, i.e. which can arrive at the construction site rapidly, may be set higher.

[0090]

For example, when there exist:

(1) constructor 1 which has a distance of "20 km" from the construction site, an evaluation of "☆☆☆" and an order receipt rate of "30 %":

(2) constructor 2 which has a distance of "5 km," an evaluation of "☆☆" and an order receipt rate of "80 %"; and

(3) constructor 3 which has a distance of "30 km" from the construction site, an evaluation of "☆☆☆☆" and an order receipt rate of "70 %," priority calculator 352B calculates the respective priorities P in accordance with the following arithmetic

expressions:

(1) priority of constructor 1: P1 = A/20 + 3B + 0.3C;

(2) priority of constructor 2 : P2 = A/5 + 2B + 0.8C; and

(3) priority of constructor 3: P3 = A/30 + 4B + 0.7C.

[0091]

It should be noted that, when A is set to 80, B is set to 10 and C is set to 5, P1 = 35.5, P2 = 40.0 and P3 = 23.5 are obtained and the priorities are therefore higher in the order of constructor 2, constructor 1 and constructor 3.

[0092]

Constructor selector 352C selects a constructor provided with predetermined conditions recorded on ROM/RAM 320 based on the priorities calculated by priority calculator 352B. In particular, constructor selector 352C selects a constructor by identifying a constructor ID provided with the predetermined conditions from among the constructor IDs recorded on ROM/RAM 320 based on the priorities.

[0093]

For example, constructor selector 352C may set a constructor having a constructor ID with the highest priority as the constructor provided with the predetermined conditions. Constructor selector 352C may select, as constructors to be recommended, constructors with predetermined higher priorities (for example, the top five constructors) or constructors with priorities that exceed a predetermined threshold.

[0094]

Recommendation information generator 352D reads out the constructor attribute information which is associated with the constructor IDs of the selected constructors and registered on constructor management DB 332, and generates recommendation information based on such constructor attribute information. Recommendation information generator 352D then provides the generated recommendation information to the relevant operator terminal device 10 (i.e. operator

terminal device 10 that has provided instructions for the constructor recommendation process).

[0095]

It should be noted that, at this time, recommendation information generator 352D is configured such that it identifies the construction prohibited constructors based on client management DB 331 and excludes them from the recommendation information.

[0096]

[3] Communication system operations

Next, specific processes performed in communication system 1 of the present embodiment will be described with reference to Figs. 11 to 13.

[0097]

[3.1] Operations at the time of construction work request

First, processes at the time of a construction work request which are performed in communication system 1 of the present embodiment will be described with reference to Figs. 11 and 12. It should be noted that Fig. 11 is a flowchart illustrating a recommendation information provision process performed at server 30 of communication system 1 of the present embodiment when a request for construction is made from a client, and Fig. 12 is a diagram illustrating an example of a written work instruction to be printed at constructor terminal device 40 when the construction work is requested.

[0098]

In the present operations, it is assumed that the information on each client and constructor to which orders may be placed is registered in advance and that necessary information is registered in advance on client management DB 331 and constructor management DB 332. In addition, in the present operations, the client requests construction by making a telephone call to service center SC, by means of facsimile or

an e-mail, or by way of a construction application page on the website established by service center SC.

[0099]

First, DB management controller 351 operates in conjunction with operator terminal device 10 or directly via communication controller 310 to obtain information on a construction request made from a client (step Sa200) and determines whether the obtained construction request information is from a request obtained from operator terminal device 10 or directly from a request obtained from the client's communication terminal device (not shown) (step Sa201).

[0100]

At this time, when DB management controller 351 determines that the construction request information is directly obtained from the client's communication terminal device (not shown), the flowchart moves to step Sa202. When DB management controller 351 determines that the construction request information is the request obtained from operator terminal device 10, the flowchart directly moves to the process in step Sa203.

[0101]

Subsequently, when DB management controller 351 has determined that the construction request information is directly obtained from the client's communication terminal device (not shown), it sends the construction request information to a predetermined operator terminal device 10 (step Sa202) and then DB management controller 351 moves to the process in step Sa203. For example, data processor 350 sends the construction request information to operator terminal device 10 which is activated and in standby mode.

[0102]

Subsequently, DB management controller 351 allocates a construction ID to the received construction request information, obtains the acquisition time and date of the

construction request information from timer 360, and then identifies a client ID of the corresponding client of the relevant construction (step Sa203).

[0103]

It should be noted that the method of identifying a client ID is arbitrary. For example, a search may be conducted in client management DB 331 based on the name, contact information or the like contained in the construction request information.

[0104]

Subsequently, DB management controller 351 reads out and obtains the client attribute information and the request history information of the relevant client from client management DB 331 based on the identified client ID (step Sa204), and causes such information to be recorded on ROM/RAM 320.

[0105]

Subsequently, DB management controller 351 updates construction history DB 333 (step Sa205) by recording the allocated construction ID in association with the construction request information on construction history DB 333.

[0106]

At this time, DB management controller 351 obtains the current time and date from timer 360 and records them on construction history DB 333 as a requested time and date. In addition, at this time, DB management controller 351 changes the status of the status information to “work-in-progress.”

[0107]

Subsequently, constructor extractor 352A conducts a search in constructor management DB 332 based on the construction request information and extracts a constructor which possesses skills for implementing the relevant construction work and which has a free schedule at the time and on the date which the client desires (step Sa206).

[0108]

In particular, constructor extractor 352A identifies qualifications that allow implementation of the construction indicated by the construction request information based on qualification management DB and extracts a constructor that possesses such qualifications or the like based on the qualification information already registered on constructor management DB 332.

[0109]

Subsequently, constructor selector 352C excludes constructors corresponding to the construction prohibited constructors from among the extracted constructors with reference to the request history information registered on client management DB 331 (step Sa207).

[0110]

Subsequently, constructor selector 352C makes constructor selector 352C calculate priorities P for the respective extracted constructors and having the construction prohibited constructors excluded therefrom, and identifies, in terms of the respective priorities P, a constructor provided with predetermined conditions (step Sa208). In particular, priority calculator 352B calculates distance X between two points based on the address of the construction site included in the construction request information and the location of the constructor, and calculates priorities P in accordance with predetermined operations (for example, formula 1). Furthermore, for example, constructor selector 352C may identify, as a constructor(s) provided with predetermined conditions, a constructor with the constructor ID with the highest priority, constructors with a predetermined number of constructor IDs from the top down, or constructors having priorities over a certain priority.

[0111]

Subsequently, recommendation information generator 352D reads out the constructor attribute information which is registered on constructor management DB 331 in association with the constructor IDs of the identified constructors, and generates

recommendation information based on such constructor attribute information (step Sa209).

[0112]

Lastly, recommendation information generator 352D provides the generated recommendation information to the relevant operator terminal device 10 or the client's communication terminal device (not shown) (step Sa210), and then the present operations are terminated.

[0113]

It should be noted that when operator terminal device 10 receives the recommendation information, and selects the recommended constructors or a constructor from among a plurality of recommended constructors based on the operation by the operator, operator terminal device 10 sends out a URL corresponding to the construction request information and the surrounding area map of the construction site, or a bar code including such content, to constructor terminal device 40, as the construction work information, and requests that a quotation be issued and places an order for the construction work when the quotation has been accepted.

[0114]

At the time of placing an order for the construction work, operator terminal device 10 distributes, by working in conjunction with an application of the relevant constructor terminal device (i.e. the terminal device of the constructor to which the order is placed) 40 or by way of an e-mail receivable by the relevant constructor terminal device 40, the construction work information containing a URL for displaying a map around the construction site with the addresses thereof to the workers of the constructor such that they can inspect the construction work information at constructor terminal device 40.

[0115]

Furthermore, constructor terminal device 40 is configured such that: it notifies

the workers of the received construction work information by means of a predetermined application; it registers the received construction work information internally in association with the application used at the time of performing the reporting processes; and it prints out the received construction work information on a piece of paper, for example, as a written work instruction such as that shown in Fig. 12, by means of a portable printer. In particular, the written work instruction output onto a piece of paper includes a bar code for identifying the relevant construction work and it may be used when conducting the site-arrival reporting and the work completion reporting.

[0116]

[3.2] Operations at the time of site-arrival and work completion reporting

Next, reporting processes, including site-arrival reporting and work completion reporting, which are performed at constructor terminal device 40 and server 30 of the present embodiment, will be described with reference to Fig. 13. It should be noted that Fig. 13 is a flowchart illustrating the reporting processes, including the site-arrival reporting and the work completion reporting, which are performed at constructor terminal device 40 and server 30 of the present embodiment. Prior to these processes, it is assumed that a plurality of work requests have been made and that predetermined information is registered on the respective databases.

[0117]

First, when constructor terminal device 40 detects a report instruction from a worker of the constructor (step Sb100), it detects the operations by such worker and obtains a construction ID for identifying the construction work (step Sb101).

[0118]

For example, constructor terminal device 40 activates a camera function of constructor terminal device 40 and obtains and performs image analysis on the bar code on the written work instruction output on a piece of paper, as has been described above, in order to identify the construction ID. Alternatively, constructor terminal device 40

activates a predetermined application in order to identify the construction ID based on the construction work information which is sent from operator terminal device 10 and which is registered internally therein.

[0119]

Subsequently, constructor terminal device 40 obtains, based on the identified construction ID, resource data (hereinafter, referred to as "resource data for reporting data transmission") for: invoking display (i.e. display for prompting an input from the worker) for conducting reporting on the relevant construction work (i.e. the site-arrival reporting and the work completion reporting); and transmitting reporting data to server 30 (step Sb102).

[0120]

It should be noted that constructor terminal device 40 may generate the resource data for reporting data transmission based on the construction ID by means of a predetermined application, or it may obtain the resource data for reporting data transmission, while working in conjunction with server 30, by identifying a web page by a URL, for performing site-arrival reporting and work completion reporting based on the identified construction ID.

[0121]

Subsequently, constructor terminal device 40 displays a predetermined image (hereinafter, referred to as an "image for creating reporting data") such as that shown, for example, in Fig. 9 based on the obtained resource data and awaits input operations by the worker (step Sb103).

[0122]

Subsequently, when constructor terminal device 40 detects the input operations by the worker (step Sb104), it receives GPS signals and generates positional information corresponding to the current position (step Sb105) and transmits reporting data that indicates the site-arrival reporting or the work completion reporting, which has

the positional information added thereto (step Sb106), and then the present operations are terminated.

[0123]

It should be noted that, at the time of reporting the work completion, constructor terminal device 40 prompts comment input and imaging of the construction site by means of a camera function so as to obtain comments, as well as images of the construction site. Then, constructor terminal device 40 creates written report data in a predetermined data format based on the obtained comments and images, and transmits reporting data to which such generated written report data is attached. However, it is also possible to obtain comments, as well as images of the construction site at the time of reporting the site-arrival and to attach them to the reporting data.

[0124]

In addition, at the time of reporting the work completion, constructor terminal device 40 may attach, to the reporting data, payment information that indicates whether the payment process is to be performed at a later date or at the time of work completion. In this case, constructor terminal device 40 may allow the client or the person in charge thereof to select the payment method, and the payment method instructed by the client is attached to the reporting data as payment information. Moreover, when costs for new parts or members are incurred during the construction work, such as replacement of a part or a member, constructor terminal device 40 attaches data regarding such additional costs to the reporting data based on the input by the worker.

[0125]

On the other hand, in server 30, when communication controller 310 receives the reporting data sent by constructor terminal device 40 (step Sb200), DB management controller 351 obtains a receipt time and date from timer 360 (step Sb201) and determines whether the reporting indicated by the received reporting data is site-arrival reporting or work completion reporting (step Sb202).

[0126]

Subsequently, when DB management controller 351 determines that the reporting indicated by the received reporting data is the site-arrival reporting, it causes the site-arrival time and date and the positional data (i.e. the site-arrival positional information) to be recorded on construction history DB 333 (step Sb203), and the present operations are terminated.

[0127]

It should be noted that, at this time, DB management controller 351 obtains a cross-check result by comparing the positional data added to the reporting and the address of the construction site, and causes such result to be registered on construction history DB 333. In addition, when comments or images are attached to the reporting data, DB management controller 351 may causes the various kinds of data to be registered on construction history DB 333.

[0128]

On the other hand, when DB management controller 351 determines that the reporting indicated by the received reporting data is the work completion reporting, it identifies the construction ID corresponding to the completion reporting, updates the respective information items of construction history DB 333 based on the receipt time and date and the positional information contained in the reporting data, and causes the written report data attached to the reporting data to be recorded on report DB 334 in association with the construction IDs (step Sb204).

[0129]

In particular, in terms of the updating of construction history DB 333, DB management controller 351 records the receipt time and date as the work completion time and date on construction history DB 333, obtains a cross-check result by comparing the positional information added to the reporting data and the address of the construction site, and records such result on construction history DB 333. In addition,

DB management controller 351 changes the status of the status information of construction history DB 333 to “completed.”

[0130]

Subsequently, payment processor 353 obtains quotation data from the database in which the quotation data (not shown) and the construction IDs are associated with each other or performs a process for calculating construction fees by calculating the number of hours (the number of man-hours) required for work completion from the site-arrival time and date (step Sb205). It should be noted that, when additional costs, such as parts costs, have been incurred, payment processor 353 calculates the construction fees including the additional costs, based on the information regarding the additional costs attached to the reporting data.

[0131]

It should be noted that, as for additional fees, they may be manually determined by the operator based on the information described in the written report data or they may be automatically determined based on the written report data and additional fee data for parts and the like registered in advance.

[0132]

Subsequently, payment processor 353 determines whether the payment process is to be conducted at a later date or at the time of work completion based on the construction ID or the payment information attached to the reporting data (step Sb206). When it is determined that the payment process is to be conducted at a later date, the present operations are terminated without any further process. However, when it is determined that the payment process is to be conducted at a later date, payment processor 353 notifies the relevant operator terminal device 10 of such payment process.

[0133]

On the other hand, when it is determined that the payment process is to be conducted at the time of work completion, payment processor 353 performs a

predetermined payment process, such as payment by a credit card, in conjunction with constructor terminal device 40 (step Sb207), and the present operations are terminated. Note that the payment process in the present embodiment is the same as before and thus, the details thereof will be omitted.

[0134]

In this manner, communication system 1 of the present embodiment can provide, in an accurate manner, to a person who wishes to have a constructor selected, information (as recommendation information) on a constructor which is capable of rapidly performing the construction work based on the distance between at least two points from the position of the construction site to the constructor, while excluding constructors with no skills for performing the externally requested construction work and constructors which are incapable of receiving the orders in terms of their schedule.

[0135]

Accordingly, communication system 1 of the present embodiment can allow a person who wishes to have a constructor selected, such as an operator, a client (including a person in charge) or the like, to select a constructor which is capable of working on the construction in a rapid and accurate manner according to the client's request, and thus, the operational efficiency of construction ordering agent services in which receiving and placing of orders for construction work are carried out in accordance with the requests from clients can be improved.

[0136]

In addition, according to communication system 1 of the present embodiment, evaluation (for example, the level of satisfaction evaluated based on scores) made by the clients on the construction performed by the respective constructors in the past may be accumulated in a database as a construction history of the constructors, and the constructors with higher evaluations can be preferentially selected, and thus, the level of client satisfaction regarding the construction work (i.e. customer satisfaction (SC)) can

be improved.

[0137]

Furthermore, according to communication system 1 of the present embodiment, when the client individually specifies a constructor to which the client wishes to refuse making a request based on the request experience in the past, the situation where an order for construction is placed again to such constructor can be prevented beforehand.

[0138]

Moreover, according to communication system 1 of the present embodiment, a constructor with a high order receipt rate can be preferentially selected based on the condition of the order receipt of the respective constructors in the past, and thus, the efficiency of the construction work and the CS of the clients can be improved. The order receipt rate indicates actual performance of the construction by the constructor with respect to the construction requests and it serves, for example, as one of the barometers for indicating the relationship of trust between the constructor and the client.

[0139]

Furthermore, according to communication system 1 of the present embodiment, the criteria for calculating priorities may be changed based on the type of construction or in response to requests from clients. For example, the priority of a constructor having a high evaluation by the clients in the past may be set higher or the priority of a constructor which can arrive at the construction site rapidly based on the distance may be set higher.

[0140]

Moreover, according to communication system 1 of the present embodiment, the criteria for calculating priorities may be changed in response to requests from clients.

[0141]

In addition, according to communication system 1 of the present embodiment,

even when it is difficult to determine constructors in a single uniform way, such as by relying on the distance between two points or the like, it is possible to decrease the number of constructor candidates which carries out the construction work and which are provided with predetermined conditions, and therefore, as compared to the case where a constructor to which an order is to be placed is selected from among a large number of constructors, such determination work can be easily carried out.

[0142]

Moreover, according to communication system 1 of the present embodiment, a request for the construction work can be made to the most appropriate constructor, and thus, the operational efficiency of construction ordering agent services can be improved.

[0143]

In addition, according to communication system 1 of the present embodiment, for example, it is possible to preferentially recommend a constructor which is good at the requested construction and to preferentially recommend a constructor which is capable of being able to cope with the conditions of the construction request, such as an urgent request, and thus, a more appropriate constructor can be selected.

[0144]

Therefore, communication system 1 of the present embodiment can improve the CS of the client and can be applied to various kinds of constructions.

[0145]

[4] Variation examples

[4.1] Variation example 1

The above-described embodiments have a configuration in which the payment process is performed at server 30; however, it may be possible to provide a server dedicated for payment process on network 20 and to perform the payment process at such server.

[0146]

[4.2] Variation example 2

In the above-described embodiments, various databases are provided in and centrally controlled in server 30; however, computer systems that serve as agents for management and control of the respective databases may each be operated by a separate computer system. In such case, the respective computer systems may each be located in a different country.

[0147]

[4.3] Variation example 3

In the above-described embodiments, construction work involving installation, maintenance, or the like, of goods has been described. However, the information provision device and the like according to the present invention can be applied to the cleaning of a facility or the like. Even in such case, such construction work can be achieved by a configuration similar to that of communication system 1 of the above-described embodiments.

[0148]

[4.4] Variation example 4

The above-described embodiments have a configuration in which written report data only including text of the work content and image data is registered in a written report; however, a model number or the reason for replacement may be described in the written report data as information on the parts replaced in the construction work. It is also possible to have a configuration in which the billing address is automatically changed by separating a situation where the user of the facilities is considered to be responsible for the requested construction work and a situation where the manufacturer of the facilities or the administrator is considered to be responsible for the requested construction work.

[0149]

[4.5] Variation example 5

In the above-described embodiments, an example is given in which formula 1 is used as a method of calculating priorities P; however, when a configuration is employed in which evaluation information for a predetermined period of time in the past or all evaluation information is to be kept in a database, it is possible to separate newer evaluations and older evaluations and to give a larger weight to the newer evaluations. In particular, in terms of evaluations, since the usability of the newer evaluations is higher than that of the older evaluations, the precision of the priority calculation can be improved.

[0150]

[4.6] Variation example 6

When calculating priorities P using, for example, formula 1 in priority calculator 352B of the above-described embodiments, in terms of the respective items "distance," "evaluation" and "order receipt rate," i.e. "AX," "BY" and "CZ," upper bound values may be provided such that "AX" is "80," "BY" is "50" and "CZ" is "30." Priority calculator 352B may calculate priorities P based on formula 2 instead of formula 1.

[0151]

Priority $P = AX + B(ay1 + by2 + cy3) + CZ$ … (formula 2)

[0152]

It should be noted that "A," "B," "C," "X" and "Z" in formula 2 are the same as those in formula 1 and that "a," "b" and "c" denote variable weight coefficients, "y1" denotes a satisfaction level in terms of construction period (a 10 point-based evaluation or the like), "y2" denotes a satisfaction level in terms of price, and "y3" denotes a satisfaction level in terms of quality. When each of the six coefficients, i.e. "A," "B," "C," "a," "b" and "c" are made variable, it is possible to select a constructor while taking the circumstances of the client into consideration, such as a client that places priority on construction period, a client that places priority on price, a client that places

priority on quality or the like.

[0153]

Moreover, in terms of “evaluation,” priority calculator 352B may only display a reference value on operator terminal device 10 without using the calculation of priorities P. It should be noted that, as for such reference value, information on the number of construction work cases carried out in the past may be included, and priority calculator 352B may display such number of construction work cases on operator terminal device 10 as such reference value.

[0154]

[4.7] Variation example 7

The above-described embodiments employ a configuration in which operator terminal device 10 and server 30 are separate computer systems; however, an input user interface and a display may be provided on server 30 and such server 30 may solely control service center SC in an integrated manner.

[0155]

In addition, service center SC may be provided overseas and only server 30 may be operated domestically. In such case, the overseas service center SC may be provided with operator terminal device 10 only and may perform data communication with domestic server 30 via network 20.

[0156]

[4.8] Variation example 8

The above-described embodiments employ a configuration in which qualification information and construction history are managed on a constructor basis; however, the qualification information and the construction history may be managed on a worker basis.

[0157]

[4.9] Variation example 9

In the above-described embodiments, only information corresponding to qualifications, or the like, which are required for the construction are recorded in the skill information; however, for example, the work types that the constructors are good at, or the work types for which the constructor has a great amount of experience in the past, "local area network (LAN) construction," "distribution board/breaker construction," "interior decorating construction," or the like, may be included in the skill information as optional information. In addition, information on support/service systems such as "24-hour support/service" or the like may be included in the skill information.

By employing such configuration, it is possible to achieve constructor recommendation with a higher degree of freedom (for example, a constructor which is good at the requested construction may be preferentially recommended), or to recommend a constructor which has such added support/service systems.

Descriptions of Reference Numerals

[0158]

1 Communication system

10 Operator terminal device

20 Network

30 Sever

40 Constructor terminal device

310 Communication controller

320 ROM/RAM

330 Storage

331 Client management DB

332 Constructor management DB

333 Construction history DB

334 Report DB

335 Qualification management DB

340 Server management controller

350 Data processor

351 DB management controller

352 Construction recommendation processor

352A Construction extractor

352B Priority calculator

352C Constructor selector

352D Recommendation information generator

353 Payment processor

360 Timer

Claims

1. An information provision device, comprising:

a record management unit that manages a database in which: constructor attribute information and qualification information are associated with each other and recorded, the constructor attribute information including at least a location and a name for each of a plurality of constructors, the qualification information including at least skill information indicating a type of construction which the constructor is capable of performing and schedule information indicating a schedule when the constructor is capable of receiving an order for construction work;

a construction request information obtaining unit that, when the construction work is requested from a client, externally obtains construction request information including a position of a construction site, construction content indicating content of the construction work, and a schedule;

an extraction unit that extracts, from the database, constructors, which are capable of receiving an order for the requested construction work, based on the construction content and the schedule indicated by the obtained construction request information and on the recorded qualification information;

a calculation unit that calculates priority information indicating priorities of the respective constructors, which are capable of receiving an order for the requested construction work, based on a calculation element including at least a distance between two points to the effect of the position of the construction site and the respective locations of the constructors included in the constructor attribute information;

a selection unit that selects at least one of the constructors which are

capable of receiving an order for the requested construction work, as a selected constructor, based on the calculated priorities: and

an information provision unit that provides information regarding the selected constructor, as recommendation information, to a person who wishes to have a constructor selected, in such a manner that the person can inspect the information.

2. The information provision device according to claim 1, wherein

evaluation information is associated with the constructor attribute information and the qualification information, and further recorded in the database, the evaluation information indicating the evaluations made by clients on the construction performed by the relevant constructor in the past, and

the calculation unit calculates the priority information based on the calculation element including the distance between the two points and the evaluation information.

3. The information provision device according to claim 2, wherein

the evaluation information includes refusing information indicating the constructor refused by the client to order for the construction .

4. The information provision device according to any one of claims 1 to 3, wherein

order receipt information and order receipt related information are associated with the constructor attribute information and the qualification information and is further recorded in the database, the order receipt information indicating that the selected constructor receives the order for construction work in the past, the order receipt related information concerning the order receipt information,

the calculation unit uses the calculation element including the order receipt

information and the order receipt related information with the distance between the two points.

5. The information provision device according to claim 4, wherein

the calculation unit calculates the priority information using the different calculation elements weighted by predetermined value, respectively.

6. The information provision device according to claim 5, wherein

the calculation unit calculates the priority information using the different calculation elements weighted by predetermined value on a client basis.

7. The information provision device according to any one of claims 1 to 6, wherein

the selection unit selects a plurality of the constructors which are provided with predetermined conditions, as selected constructors.

8. The information provision device according to any one of claims 1 to 7, wherein

the selection unit selects the constructor with the highest priority as the selected constructor.

9. The information provision device according to any one of claims 1 to 8,wherein

the skill information includes at least one of work types which the constructors are good at, work types for which the constructor has a great amount of experience in the past and information on support/service systems of the constructors.

10. A constructor management device, comprising:

the information provision device according to any one of claims 1 to 9,

a site-arrival reporting obtaining unit that obtains site-arrival reporting and

site-arrival positional information from a communication terminal device of an order-received constructor which is selected based on the recommended information and which receives the order for the construction work, the site-arrival reporting indicating that the constructor has arrived at the construction site, the site-arrival positional information indicating the position at the time of the site-arrival reporting, the site-arrival reporting and the site-arrival positional information being associated with each other;

a site-arrival time/date information obtaining unit that obtains information on a site-arrival time and date, indicating a time and date when the site-arrival reporting is obtained;

a site-arrival positional information cross-check unit that cross-checks whether or not the site-arrival position indicated by the site-arrival positional information matches the location of the construction site; and

a management unit that performs data management of the status of construction work at the order-received constructor based on the obtained site-arrival time and date and a cross-check result of the site-arrival position.

11. A constructor management device, comprising:

the information provision device according to any one of claims 1 to 9,

a work completion report obtaining unit that obtains work completion reporting from a communication terminal device of the order-received constructor, the work completion reporting indicating that the construction work has been completed;

a work completion time/date information obtaining unit that obtains information on a time and date of work completion, indicating a time and date when the work completion reporting is obtained; and

a management unit that performs data management of the status of construction work at the order-received constructor based on the obtained work completion time and

date.

12. The information provision device according to claim 11, wherein

the work completion report obtaining unit obtains data of work report as report data with the work completion reporting, the work report created by the constructor that performs the construction work or a worker of the constructor.

13. The information provision device according to claim 12, wherein

the report data includes image data having image of the construction site.

14. The information provision device according to claim 13, wherein

the image data includes at least image data of the construction site before the construction work and image date of construction site after the construction work.

15. The information provision device according to claim 13 or 14, wherein

the report data includes data having comment commented on the image.

16. The information provision device according to any one of claims 11 to 15, further comprising

a report provision unit that:

records the report data in the database when the report data is obtained; and

provides the report data, which is selected among from a plurality of the report data recorded in the database, in such a manner that the person can inspect the information.

17. A program, causing a computer to function as:

a record management unit that manages a database in which: constructor attribute information and qualification information are associated with each other and recorded, the constructor attribute information including at least a location and a name for each of a plurality of constructors, the qualification information including at least skill information indicating a type of construction which the constructor is capable of performing and schedule information indicating a schedule when the constructor is capable of receiving an order for construction work;

a construction request information obtaining unit that, when the construction work is requested from a client, externally obtains construction request information including a position of a construction site, construction content indicating content of the construction work, and a schedule;

an extraction unit that extracts, from the database, constructors, which are capable of receiving an order for the requested construction work, based on the construction content and the schedule indicated by the obtained construction request information and on the recorded qualification information;

a calculation unit that calculates priority information indicating priorities of the respective constructors, which are capable of receiving an order for the requested construction work, based on a calculation element including at least a distance between two points to the effect of the position of the construction site and the respective locations of the constructors included in the constructor attribute information;

a selection unit that selects at least one of the constructors which are capable of receiving an order for the requested construction work, as a selected constructor, based on the calculated priorities: and

an information provision unit that provides information regarding the

selected constructor, as recommendation information, to a person who wishes to have a constructor selected, in such a manner that the person can inspect the information.

18. The program according to claim 17, the program further causing a computer to function as:

a site-arrival reporting obtaining unit that obtains site-arrival reporting and site-arrival positional information from a communication terminal device of an order-received constructor which is selected based on the recommended information and which receives the order for the construction work, the site-arrival reporting indicating that the constructor has arrived at the construction site, the site-arrival positional information indicating the position at the time of the site-arrival reporting, the site-arrival reporting and the site-arrival positional information being associated with each other;

a site-arrival time/date information obtaining unit that obtains information on a site-arrival time and date, indicating a time and date when the site-arrival reporting is obtained;

a site-arrival positional information cross-check unit that cross-checks whether or not the site-arrival position indicated by the site-arrival positional information matches the location of the construction site; and

a management unit that performs data management of the status of construction work at the order-received constructor based on the obtained site-arrival time and date and a cross-check result of the site-arrival position.

19. The program according to claim 17, the program further causing a computer to function as:

a work completion report obtaining unit that obtains work completion reporting

from a communication terminal device of the order-received constructor, the work completion reporting indicating that the construction work has been completed;

a work completion time/date information obtaining unit that obtains information on a time and date of work completion, indicating a time and date when the work completion reporting is obtained; and

a management unit that performs data management of the status of construction work at the order-received constructor based on the obtained work completion time and date.

20. An information provision method, comprising:

a construction request information obtaining step in which construction request information externally is obtained when the construction work is requested from a client, the construction request information including a position of a construction site, construction content indicating content of the construction work, and a schedule;

an extraction step in which constructors is extracted from the database, based on the qualification information, and the construction content and the schedule indicated by the obtained construction request information, the qualification information including at least skill information indicating a type of construction which the constructor is capable of performing and schedule information indicating a schedule when the constructor is capable of receiving an order for construction work, the qualification information, and the construction content and the schedule be associated with at least a location and a name and recorded in the database,

a calculation step in which priority information is calculated based on a calculation element including at least the distance between the two points to the effect of the position of the construction site and the respective locations of the

constructors in the constructor attribute information;

a selection step in which at least one of the constructors which are capable of receiving an order for the requested construction work is selected, as a selected constructor, based on the calculated priorities: and

an information provision step in which information regarding the selected constructor is provided, as recommendation information, to a person who wishes to have a constructor selected, in such a manner that the person can inspect the information.

21. A communication system, comprising:

a plurality of communication terminal devices; and

a sever that provide variety of information to the plurality of communication terminal devices, and

the sever having:

a record management unit that manages a database in which: constructor attribute information and qualification information are associated with each other and recorded, the constructor attribute information including at least a location and a name for each of a plurality of constructors, the qualification information including at least skill information indicating a type of construction which the constructor is capable of performing and schedule information indicating a schedule when the constructor is capable of receiving an order for construction work;

a construction request information obtaining unit that, when the construction work is requested from a client, externally obtains construction request information including a position of a construction site, construction content indicating content of the construction work, and a schedule;

an extraction unit that extracts, from the database, constructors,

which are capable of receiving an order for the requested construction work, based on the construction content and the schedule indicated by the obtained construction request information and on the recorded qualification information;

a calculation unit that calculates priority information indicating priorities of the respective constructors, which are capable of receiving an order for the requested construction work, based on a calculation element including at least a distance between two points to the effect of the position of the construction site and the respective locations of the constructors included in the constructor attribute information;

a selection unit that selects at least one of the constructors which are capable of receiving an order for the requested construction work, as a selected constructor, based on the calculated priorities: and

an information provision unit that provides information regarding the selected constructor, as recommendation information, to a person who wishes to have a constructor selected, in such a manner that the person can inspect the information.

22. An information provision device, comprising:

an operation unit to input, when the construction work is requested from the client, the construction request information indicating the position of the construction site, the construction content indicating content of the construction work, and a construction period;

a recommendation information obtaining unit that obtains, as recommendation information, information regarding at least one selected constructor which is selected based on the construction content and the construction period indicated by the obtained construction request information and on a calculation element including at least a distance between two points to the

effect of the position of the construction site and the respective locations of the constructors included in the constructor attribute information; and

an information presentation unit that displays the information regarding the selected constructor, based on the recommendation information obtained by the recommendation information obtaining unit, to a person who wishes to have a constructor selected, in such a manner that the person can inspect the information.

23. The information provision device according to claim 22, further comprising:

a site-arrival reporting obtaining unit that obtains site-arrival reporting and site-arrival positional information from a communication terminal device of an order-received constructor which is selected based on the recommended information and which receives the order for the construction work, the site-arrival reporting indicating that the constructor has arrived at the construction site, the site-arrival positional information indicating the position at the time of the site-arrival reporting, the site-arrival reporting and the site-arrival positional information being associated with each other;

a site-arrival time/date information obtaining unit that obtains information on a site-arrival time and date, indicating a time and date when the site-arrival reporting is obtained;

a site-arrival positional information cross-check unit that cross-checks whether or not the site-arrival position indicated by the site-arrival positional information matches the location of the construction site; and

a management unit that performs data management of the status of construction work at the order-received constructor based on the obtained site-arrival time and date and a cross-check result of the site-arrival position, wherein

the information presentation unit provides status of the construction work managed by management unit and the result of the cross-check, in such a manner that the person can inspect the information.

24. The information provision device according to claim 22,

a work completion report obtaining unit that obtains work completion reporting from a communication terminal device of the order-received constructor, the work completion reporting indicating that the construction work has been completed;

a work completion time/date information obtaining unit that obtains information on a time and date of work completion, indicating a time and date when the work completion reporting is obtained; and

a management unit that performs data management of the status of construction work at the order-received constructor based on the obtained work completion time and date.

25. A program, causing a computer to function as:

an operation unit to input, when the construction work is requested from the client, the construction request information indicating the position of the construction site, the construction content indicating content of the construction work, and a construction period;

a recommendation information obtaining unit that obtains, as recommendation information, information regarding at least one selected constructor which is selected based on the construction content and the construction period indicated by the obtained construction request information and on a calculation element including at least a distance between two points to the effect of the position of the construction site and the respective locations of the constructors included in the constructor attribute information; and

an information presentation unit that displays the information regarding the selected constructor, based on the recommendation information obtained by the recommendation information obtaining unit, to a person who wishes to have a constructor selected, in such a manner that the person can inspect the information.